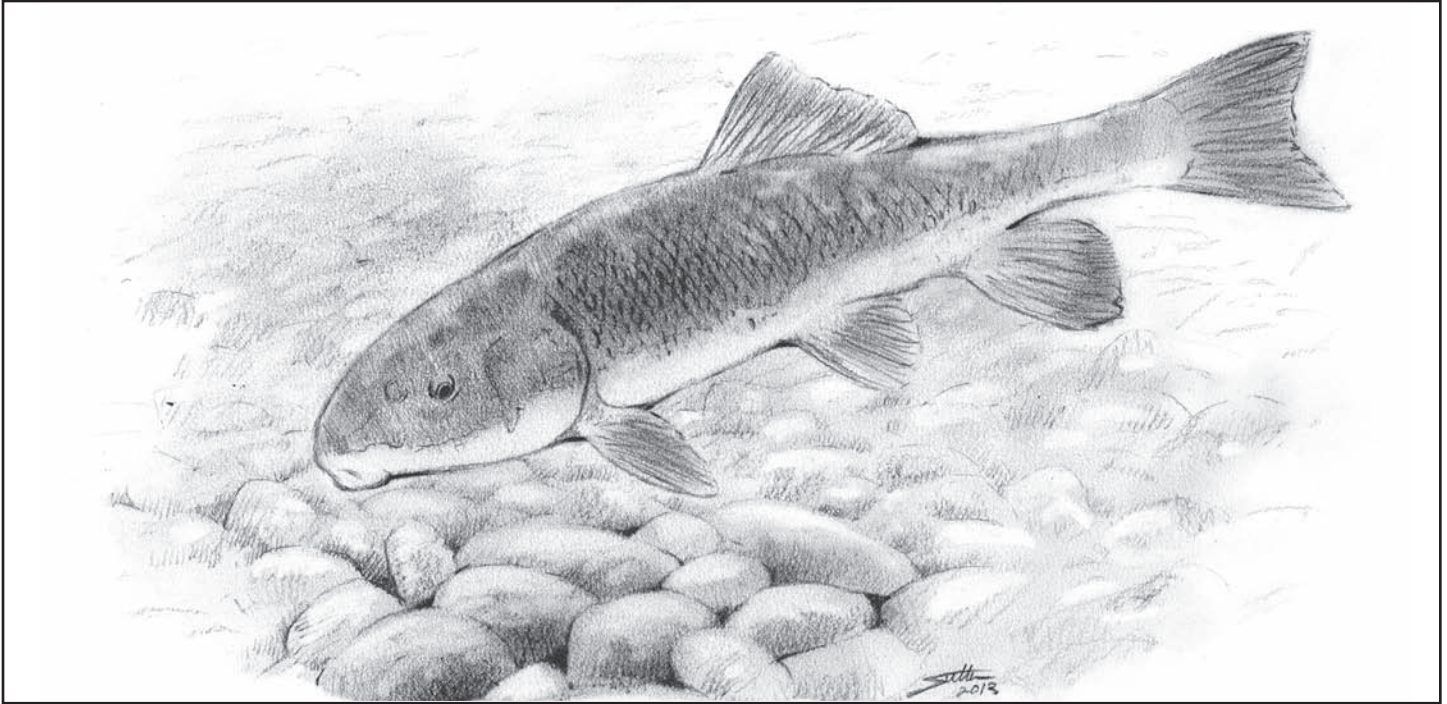


June Sucker

(*Chasmistes liorus*)



The June sucker is a survivor. It is one of 13 species of fish that thrived in the waters of ancient Lake Bonneville, which extended across 32,000 square miles of north-central Utah, southeastern Idaho and northeastern Nevada between 14,500 and 25,000 years ago. Back then, each year, June suckers swam up the numerous rivers that reached the edge of this huge lake to smaller tributaries where they spawned to perpetuate their species.

Time passed unnoticed around the lake at that time since humans had not yet made it to the area. Then suddenly, without notice, there was a massive flood as the waters of ancient Lake Bonneville broke through the rocks at Red Rock Pass near Zenda, Idaho. This catastrophic event, which took place 14,500 years ago, resulted in a rapid lowering of the level of the lake by more than 300 feet and cut off access to many of the spawning tributaries used by June sucker. Despite this, they continued to survive and even as the lake continued to shrink, eventually leaving behind its largest remnants, the Great Salt Lake, Utah Lake and Sevier Lake.

By the time humans first arrived in Utah 10,000 to 12,000 years ago, June sucker were found solely in Utah Lake. The millions of June sucker and other fish species found in the lake served as a vital food source for early people.

Today the situation is much different. The number of adult June sucker in Utah Lake is now in the thousands versus

millions, and the fish is now federally listed as an endangered species. Its survival has become dependent on human intervention, but the species is making a comeback.

DESCRIPTION

The June sucker is classified as a lakesucker in the sucker family, Castostomidae. Unlike most other suckers, the June sucker is not a bottom-feeder. Its mouth is positioned facing slightly forward, allowing it to collect zooplankton as it swims. A large, steel-gray fish with a greenish-white belly, the June sucker grows to between 17 and 24 inches in length and weighs about five pounds. Its head is wide and rounded, with a distinct hump on its snout. A long-lived species, individuals can live over 40 years. The fish's common name derives from the fact that its peak spawning period occurs during the month of June.

DISTRIBUTION

Endemic to Utah Lake, the June sucker occurs nowhere else in the world, except for a few refuge populations established elsewhere as part of its recovery effort. Twenty-four miles long, 13 miles wide and covering 94,000 acres, Utah Lake holds the distinction of being the largest natural, freshwater lake west of the Mississippi River.

HISTORY

The June sucker is one of 13 native fish that originally inhabited Utah Lake. It, and the other fish of the lake, played a significant role in the settlement of the surrounding area and of the development of civilization in Utah as well. In 1847, when Mormon pioneers first arrived in the area, Utah Lake was a vital resource that provided needed water and food for them and the Native Americans living there at the time. The early Mormon pioneers relied heavily on fish within the lake when an early frost killed much of their crops in 1848 and swarms of grasshoppers destroyed much of what was left. For survival, pioneers formed fishing companies and used various methods such as large nets to capture thousands of pounds of June sucker, Utah sucker, Bonneville cutthroat trout and other native fish species. The number of fish in the lake seemed to be infinite as expressed in 1854 by George Washington Bean, one of Provo's first settlers when he reminisced, "So great was the number of suckers and mullets passing continuously upstream that often the river would be full from bank to bank as thick as they could swim for hours and sometimes days together."

The locals weren't the only ones to cast their nets and lines. Word spread about the lake's generous offering of fish, and fishermen from neighboring valleys descended upon the area. There were stories of being able to pluck tasty trout or sucker out of the water with bare hands, or catch all they wanted by simply dragging unbaited hooks through the water.

Selling fish also became big business. Individual fish peddlers in Salt Lake City sold wagonloads of sucker and trout they had caught in Utah Lake and the surrounding rivers and streams. Leaders of the Church of Jesus Christ of Latter-day Saints (LDS) established tithing yards to receive fish shipped from the lake. Loyal church members were expected to give 10 percent of their catch to the church as tithing. Thousands of pounds of "tithing fish" were used to pay public workers who were involved in building many landmarks including the Fillmore Statehouse, Salt Lake City's LDS Temple and the fence around Temple Square.

Eventually a variety of events began to threaten the health of Utah Lake and its fish populations. In the 1850s, numerous canals and diversion dams were constructed, which created barriers that prevented June sucker from swimming upstream to spawn. Unscreened ditches also caused thousands of adult and newly hatched fish to end up in farm fields instead of the lake. Later, in the 1880s, de-watering of the Provo River for irrigation, dumping of sugar beet processing waste, sawdust from sawmills and sewage into the streams that fed the lake led to further declines in the number of fish.

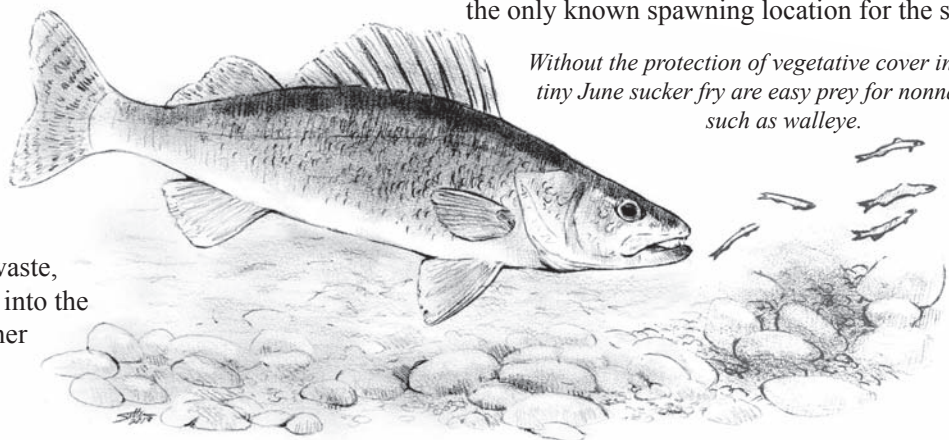
Through the years, tons and tons of fish were collected from the lake with little thought given to their long-term survival. As fewer and fewer of the native fish species were found in the lake, instead of making efforts to protect those species, people decided to introduce a variety of nonnative fish with hopes these new species would allow the lake to continue to serve as a source of food and a commercial fishery.

Carp, a hardy fish popular in other parts of the world and known to the pioneers, were introduced into the lake in 1881. Their introduction and subsequent increase in number ended up changing Utah Lake forever. The aggressively foraging carp soon destroyed the duckweed on the surface of the water and uprooted vegetation on the lake floor. With limited vegetation, waves stirred up the sediments on the bottom of the lake, making the water very murky and turbid. The lack of vegetation left young June sucker without cover in which to hide, making them vulnerable to predation by a range of other introduced nonnative fish species.

Historically, June sucker were very abundant in Utah Lake. In 1889, David S. Jordan visited the lake and recorded that Utah Lake was "...the greatest sucker pond in the universe." Between 1901 and 1905, an average of 178 tons of suckers were still being harvested each year by commercial fishermen, though over 90 percent of their catch was comprised of nonnative species. Though many other factors created an unfriendly habitat for the June sucker, including a severe drought in the 1930s that greatly reduced the population, in the early 1950s, catch of suckers was still relatively high, with reports of as many as 1,250 caught in a single day of commercial seining (netting).

By the 1970s, June sucker numbers had plummeted. The decline corresponded with the introduction of popular, but predacious, white bass and walleye that had been introduced to the lake in the mid-1950s. On April 30, 1986, June sucker were listed as endangered species with the number of them thought to be under 1,000 fish. At that time, the U.S. Fish and Wildlife Service designated the species as having a high risk of extinction, a low recovery potential, and the presence of conflict. Nonnative fish, habitat alterations, and water development and operations were the primary threats to June sucker at the time it was listed. The lower 4.9 miles of the Provo River was identified as critical habitat because this was the only known spawning location for the species.

Without the protection of vegetative cover in the lake, tiny June sucker fry are easy prey for nonnative fish such as walleye.



LIFE CYCLE

June sucker reach reproductive maturity at age five or six. Every year in late spring, adults begin a journey up the lake's tributaries in search of a place to spawn. The small, pale, yellow eggs deposited by the females hatch in four to ten days depending on temperature of the water and other conditions. After hatching, the tiny larval June sucker emerge from the gravel beds in which the eggs were laid and drift downstream toward Utah Lake. Their chances of survival are limited because of predation from nonnative fish, insufficient food, insufficient cover, water quality and other factors. Both larval and juvenile June sucker feed on plankton. Growth rates for young June sucker are slow, making them extremely vulnerable to predation during the early stages of life. Biologists have determined that lack of nursery habitat and nonnative fish predation are the most significant factors limiting the survival of young June sucker.

RECOVERY EFFORTS

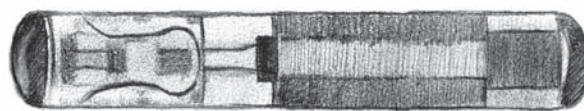
To help prevent extinction of the June sucker, in April of 2002 the June Sucker Recovery Implementation Program (JSRIP) was established. The JSRIP Program is a multi-agency cooperative effort involving the U.S. Fish and Wildlife Service, the Utah Department of Natural Resources, a number of water resource agencies and a variety of outdoor and environmental non-profit organizations. The program is charged with coordinating and facilitating the recovery of the June sucker, while balancing and accommodating water resource needs of the human population.

The June Sucker Recovery and Implementation Program has grouped recovery tasks into six main categories: 1) nonnative sportfish management; 2) habitat development and maintenance; 3) water management and protection to benefit June sucker; 4) genetic integrity and augmentation; 5) research, monitoring and data management; and 6) information and education. The two main goals of the program are to recover the June sucker to the point that it no longer requires protection under the Endangered Species Act and to ensure continued operation of existing water facilities and future development of water resources for human use.

Little information on the basic biology and habitat needs of June sucker existed prior to its endangered status. Limited numbers of individuals remaining in wild population, existed in altered environmental conditions, making assessment of biological needs difficult. Thus, in advance of recovery actions, research has been necessary to provide insight into the life history and habitat requirements of June sucker and its interactions with other species. This information is essential for guiding recovery activities and measuring success.

Biologists have used a variety of technological and research methods to track movements of the June sucker. One popular

method is to use small electronic markers called passive integrated transponders or "PIT" tags, which are inserted into selected fish just under the skin through a syringe. These marker tags are similar to microchips used by pet owners. A PIT tag is a radio frequency device that transmits a unique code to a reader (scanner). Fish can be scanned by hand when captured in fish sampling studies or scanners can be placed in tributaries that June sucker use to spawn. Information is electronically recorded whenever a June sucker passes the scanning device. PIT tags allow biologists to gain vital information such as movement patterns, growth and survival rates.



*PIT tag that is inserted in fish for tracking purposes.
Actual size is about 1/4 inch.*

As part of their efforts to recover June sucker populations, biologists also rear June sucker in Division of Wildlife Resources hatcheries for release into the wild. Brood stock were developed by collecting and artificially spawning adult suckers from the Provo River in order to best represent the genetic composition of the wild population. Progeny raised in the hatcheries are maintained in captivity and also in several reservoirs and ponds. Young suckers are placed into Utah Lake when they are about 8 inches long, which is large enough to avoid predators. It has been shown that these fish have survived and matured to the point they are able to spawn in the wild themselves.

As of 2012, approximately 440,012 hatchery-reared June sucker had been stocked into Utah Lake, increasing their population from hundreds to tens of thousands. Because of these stocking efforts, June sucker are becoming so plentiful in Utah Lake they are moving into tributaries, spawning and producing larval offspring in areas not expected. Spawning and larval drift have now been documented in American Fork Creek, Battle Creek, Spring Creek, and the Spanish Fork River, as well as in the two main focus areas, Hobble Creek and the Provo River. Unfortunately, despite the increase in adult June sucker, larvae and juveniles are still not surviving as desired due to lack of suitable nursery habitat and predation by nonnative fish. Because of this, further research and additional measures have been necessary to facilitate survival of the species.

Of the 24 nonnative fish species that were introduced to the lake over time, those which were especially successful in establishing self-sustaining populations included the common carp, white bass, black bullhead, channel catfish, largemouth bass, and walleye. Part of the recovery effort is to try to learn

which combination of species will best contribute to maintaining a healthy and balanced aquatic community in Utah Lake that supports recovery of June sucker. Originally, the lake supported Bonneville cutthroat trout as the top predator. Because of differences in the lake today, it is uncertain if Bonneville cutthroat trout would be able to survive. Continued research will provide insights that can be applied to long-term management of Utah Lake's aquatic community.

It has been determined that the existence of common carp in Utah Lake present an even greater threat to the health of the lake's ecosystem and June sucker survival. In the most recent lake-wide fish survey, common carp represented an overwhelming 91 percent of the fish biomass in the lake. Because of this, prolonged efforts to mechanically remove common carp from the lake are being undertaken. In 2010, the JSRIP began contracting with commercial fish harvesters to have five million pounds of common carp removed from Utah Lake each year. These efforts will significantly aid the recovery process by promoting more vegetative growth and shelter for young June sucker.

Additionally, habitat improvement projects to the tributaries of Utah Lake have been undertaken. Human induced changes to habitat that affected June sucker populations in the past included channelization and diking of tributaries, placement of diversion structures that limited access to potential spawning and nursery areas, filling of tributary floodplain habitats and wetlands and reducing habitat for early life stages of June sucker.

One major habitat improvement project that has been completed was relocating and reconstructing Hobble Creek to an ecological state closer to its original condition to reestablish a natural June sucker spawning area. In the 1950s, Hobble Creek was moved from its historic bed for agricultural reasons and its water was channeled into a new mechanically created streambed. This altered creek was steep and straight and made it impossible for native fish to use it as a spawning ground as they had for many years. The Hobble Creek Restoration Project and other projects that preserve habitat that help June sucker survive and flourish, will allow the lake's ecosystem to function more efficiently and support a more diverse aquatic community.

Water development in the Utah Lake Basin also impacted the natural hydrology of Utah Lake and its tributaries, altering conditions in which June sucker evolved. Historic water management practices that contributed to the endangered status of the June sucker included changing tributary hydrology, specifically during spawning and nursery periods, and increasing lake level fluctuations. The Recovery Program has been effective at developing and implementing spawning and nursery flow recommendations in the Provo River that mimic a natural hydrograph while continuing to maintain and develop water for human use even in low water years.

Educating members of the public about the value of Utah Lake, its ecosystem, the June sucker and recovery elements has been an integral component of the June sucker recovery program since its inception. A number of activities have been conducted under this recovery element, including the publication of a book entitled *Utah Lake: Legacy*, authored by local historian Robert Carter, that gives a detailed account of Utah Lake and the important role the native fish community has played in the heritage of the region and of the state. In addition, the Utah Lake Commission, a quasi-government agency formed in 2007 and funded and empowered by 21 area governments, including neighboring municipalities of Utah County and the Department of Natural Resources, working in cooperation with the JSRIP has initiated an outreach effort to help educate the public about the values of Utah Lake.

The June sucker is considered an indicator species, a term biologists use to describe a species whose health gives an accurate picture of the overall health of the ecosystem in which it lives. When an indicator species is not doing well, the ecosystem as a whole is not functioning as it should. This has been the case with the Utah Lake ecosystem and the June sucker. Continued survival of June sucker and the revitalization of Utah Lake go hand-in-hand. Together they will not only provide healthy habitat for the fish, but benefit the entire Utah Lake ecosystem and human community as well.

ADDITIONAL INFORMATION

Carter, Robert D. 2003. *Utah Lake: Legacy*. Vanguard Media Group, Salt Lake City, UT. http://www.utahlakecommission.org/Utah_Lake_Legacy.pdf

June Sucker Recovery Implementation Program website:
<http://www.junesuckerrecovery.org/>

Utah Lake Commission website: <http://utahlake.gov/>



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